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in Vietnam 2002-2006

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Abstract

This paper shows the evolution of poverty in Vietnam during the deepening of trade liberalization and examines the impact of trade-related variables at the household level. The study is based on a panel dataset of households followed in 2002, 2004 and 2006. Trade-related variables at the household level are defined as the household specialization in terms of production and employment with respect to the type of jobs (wage earners or self-employed) and sectors (import-competing or exported manufactured goods, services, and in agriculture, rice, exported, subsistence and import-competing crops). For the poor, besides the expected positive impact of working in an export-related sector (in industry and in agriculture), diversification in self-employed non-farm activities appears to have been efficient at alleviating poverty. Moreover, the import-competing sectors (in industry and in agriculture) play also a positive role in poverty alleviation. The latter channel could be hindered in the near future, as Vietnam is now in the process of decreasing its import protection.

JEL Classification numbers: C23;I32;O19;O53

Key Words: trade liberalization, poverty dynamics, Vietnam

1. Introduction

The impact of trade liberalization on household welfare has been widely debated. Studies based on cross-country data have shown a positive impact of trade on growth and hence, on poverty (Dollar and Kraay, 2004). However, micro evidence at the household level shows that trade creates losers as well as winners (Goldberg and Pavcnik 2007). In this paper we focus on poverty dynamics in an Asian country, Vietnam.

Vietnam has been often cited as an example of a successful economic liberalization and trade opening which managed to improve household welfare. Poverty dropped sharply, from 58% of the population at the start of economic reform to a mere 16% in 2006 (Glewwe, Gragnolati and Zaman 2002). Meanwhile, inequality either decreased or remained stable. Vietnamese experience in that respect contrasts with that of China where inequality increased during economic reform (Ravallion 2010).

Poverty is studied in this paper in a micro-economic perspective, at the household level. A household is deemed poor if his consumption per capita is below a minimum level. Studies on poverty are often based on cross sections and focus mostly on one indicator, the share of poor in the population (the headcount). Here we look not only at the headcount but also at how far is a given household below the minimum level, namely the severity of poverty. Actually, we show that the severity of poverty increased for some household categories between 2002 and 2006, despite the general drop in the share of total population below the poverty line. Indeed, the distribution among the poor themselves matters. Households who remained poor after 2002 are far below the poverty line and could not easily improve their living conditions.

Theoretical analyses have shown the importance of looking at the dynamics of poverty. Recent empirical surveys on poverty have stressed the importance of following poverty mobility with longitudinal data (Dercon and Shapiro, 2009; see also Fall and Menendez, 2009, for developed countries). It matters indeed to know who escape poverty and who is staying behind, who is vulnerable to transient poverty spells or is subject to chronic poverty, especially in times of overall economic reform.

We take stock from the existence of repeated household surveys in Vietnam, where a subset of households were interviewed three times, in 2002, 2004 and 2006. Thus, we are able to follow these households over time and relate their fate to change in contextual trade-related changes.

Previous papers looked at poverty in Vietnam during the 90s, using another available panel dataset which stretched over 1993-1998. We update the results of these papers for the period 2002-2006.

The bulk of domestic and export liberalization occurred in the 90s and deepened in the 2000s: textile industry soared, major trade agreements were signed and implemented, beginning with the free trade

agreement with the United-States in 2001, and foreign direct investment (FDI) flew in. On the import side, liberalization started only after 2000. This policy turn can matter on income distribution for households up to then protected from foreign competition.

We characterize extensively the nature of the contextual trade-related variables that influence households. We distinguish first between self-employed and wage earners and we take also into account the fact that in a developing country such as Vietnam, an individual might have multiple activities and work part-time for wage, while also being self-employed. We distinguish the trade orientation of the sector one is working in: export industry, import-competing industry, and non-traded services. Moreover, based on a previous paper on rural households (Coello 2009), we extend this characterization to farmers. We thus define agricultural households depending on the market orientation of the crops they produce: import-competing, non-traded crops (subsistence) or exported crops. The latter group is further divided between the main export crops (coffee, pepper, cashew nuts, and tea) and other cash crops. Rice producers appear as a separate category, as rice, which is the main staple in Vietnam, is exported, imported and locally consumed either on the farm or sold on domestic markets.

We relate the change in real per capita expenditure between 2002 and 2006 to household characteristics, location and farm characteristics and change in the trade-related contextual variables. We then consider specifically as a dependent variable the change in expenditures for households who were poor in 2002. We perform different types of robustness checks. First, we redo the first regression not with the change in the contextual variables between 2002 and 2006, but with their level in 2002. Second, we consider an alternative definition of job categories. Third, we use a multinomial logit on poverty transitions, and we consider in particular, households who were poor in 2002 and escaped from poverty since then.

We find that in Vietnam, new opportunities that improved the welfare of the general population did not systematically reach the poor. For instance, the extension of formal wage earnings and the rise in exports, both in industry and in agriculture, as well as the growth of the services sector improved the living condition of the population in general. However, those who were poor in 2002 were mostly rural and depending on agriculture. Hence, cash crops exports were important indeed for them, as well as new opportunities in self-employed non agricultural activities, and they also kept relying on import-competing crops.

2. Two decades of trade liberalization in Vietnam and its likely impact on household welfare and poverty

The two steps of trade liberalization

Economic reform in Vietnam started in 1986 (the Doi Moi). The process involved domestic liberalization, from a state economy to a market oriented one. Agriculture was promoted through

decollectivization and a land reform (Gallup (2003), Brandt and Benjamin (2002), Minot, and Goletti (2000) Edmonds and Pavcnik (2004).

On the trade side, Vietnam gradually turned from an import-substitution policy to an export-promoting policy. Liberalization occurred in two steps. During the first period, the 1990s, multiple exchange rates were unified, enterprises were allowed to export outside the socialist countries of the Council of Mutual Economic Assistance (CMEA), pro-FDI legislation was passed and a number of regional and multilateral agreements were negotiated. Vietnam joined the ASEAN, the AFTA and became a member of the GATT in 1995. Export quotas were eliminated in 1995 for all commodities except rice. In the process of accession to the WTO, import quotas were gradually transferred into tariffs, except for eight categories of goods (Athukorala 2002; Auffret 2003). The transfer from Non tariff barriers to tariff protection resulted actually in an *increase* in the level of tariffs, even though some important inputs, such as fertilizer, or later, industrial machinery, experienced a drop in tariffs. Overall, during the nineties, import tariffs and to a lesser extent export tax, remained complex and subject to temporary rises; import protection of final goods remained at a high level (Figure 1). As a consequence, during this first period, the effects of openness mostly occurred through exports (Niimi et al. 2007, Justino and al. 2008, Coello 2008).

The signing in 2001 of the bilateral trade agreement with the United States can be seen as the start of the second stage of liberalization. Import protection on final goods started to decline, leading to a competition between domestic and imported products. This trend was further exacerbated with the entry of Vietnam into the WTO in 2007. As a result, the share of trade in Vietnam GDP boomed in the 2000s. Exports and imports of goods and services represented respectively 55% and 57% of GDP in 2000, 76% and 90% in 2006. FDI also rose substantially, after the requirement of a joint-venture with domestic investors was suppressed after 2000.

Trade liberalization and households: the different channels

In this paper, we focus on the micro linkages going from trade liberalization to households' income (surveyed in Hertel and Reimer (2005) and Goldberg and Pavcnik (2004)). We do not consider macro linkages that would go through the overall stabilization of the economy and growth. We follow and precise the framework described in Winters, McCulloch and Cirera (2001). Trade liberalization hits households through direct and indirect effects. Direct effects go through products (their prices, quantities and number of varieties) and factors markets (wages, employment, and new job opportunities). The indirect effects (not examined in this paper) concern changes in government revenues and social spending. The general framework has been widely applied, and in particular to Vietnam during the 90s (Justino, Litchfield and Pham, 2008; Niimi, Vasudeva-Dutta and Winters,

2007). In the following, we precise this framework in the case of Vietnam during the second stage of trade liberalization.

In the case of Vietnam, the economic structure has changed indeed, but more on the production side than on employment. Despite a rise of industry share in GDP from 23% in 2000 to 40% in 2006, the share of industry in total employment remained barely the same, at around 20%. Even with stable employment, factor earnings might have increased in industry. However, we must add here a caveat: households where a majority of members are working in export industries count less than 4% of the dataset, almost as much as households involved in import-competing industries. Most households (66%) are dependent on agriculture, even if this proportion is decreasing over time. Last, around one household out of four is dependent on (non-traded) services, and this share is increasing.²

Domestic and trade liberalizations might also have altered the job pattern, namely the share of formal wage jobs (McCraig 2009). Unfortunately, we do not know if a job is informal or not. However we know in the dataset we will be using in this paper, that a mere 11% of households have a majority of their members working for wages (an average household counts four adult members). This proportion increases slightly between 2002 and 2006 (table 1). Most households have a majority of their members in self-employed farm activities (33%), even if this proportion is decreasing over time. Households with members self-employed in non-farm activities are as numerous as households with wage earners. Last, over 40% of households members engage in multi-activity jobs and this proportion is increasing over time. Typically, this might concern farmers diversifying their activities with petty trading or transport on a part-time basis. Thus, the evolution of self-employment as well as multiple-activity jobs matters for households, and as we will see, more for the poorest.

A particularly significant crop in Vietnam is rice. Rice is the main staple and accounts for more than 68% of the average calories intake in 2006 and even 78% for the poor (Glewwe and Vu, 2008). Rice in Vietnam has a special status, as it is at the same time, exported and imported, sold on domestic market and retained for own consumption by rural households. Besides rice, trade liberalization has promoted export crops such as coffee, pepper or cashew (labeled hereafter, the “main export crops”) and farmers who could afford it took advantage of these new opportunities by switching their crop mix (Coello 2009). For instance, many farmers in Central Highlands have switched to coffee and more recently to cashew (Benjamin and Brandt, 2002, Benjamin, Brandt and Coello 2009). However, half of total agricultural households still live mostly from rice production, 6% from the main export crops, and 29% from other export crops. In addition, 9% of these households are dependent on import-competing crops (such as maize) that could be affected by the import liberalization in the years to come.

² The dataset is detailed in the next section.

3. The panel data

Our analysis is based on data from the Vietnam Household Living Standards Surveys (VHLSS) in 2002, 2004 and in 2006. The sample of households interviewed is very large: 30,000 households in the first survey, 9,000 households in the second and 9200 households in the third. All surveys include two questionnaires, one on households and one on the district of residence at the village level.³

We focus on the panel subset of 1947 households who were followed through 2002-2004-2006.⁴ The panel dataset compares well in terms of poverty with national figures and with the entire VHLSS dataset (table A1). According to the General Statistic Office, 28.9% of the population was below the poverty line in 2002. The figures for the same year are similar in the entire household survey (28.4%) and in the panel dataset (29.4%). The evolution of poverty is also similar.. Another hint of the good fit of the panel sample is given with respect to education (table A2). In 2002, 30.9% of the households' heads in the entire survey had no education; they were 31% in the panel sample.

Characterizing household economic activities

We start with the main sector of activity reported by each individual during the last twelve months. We then sum for each household the number of individuals who reported working in different sectors. For that purpose, the ISIC code of any sector was (manually) matched with the SITC classification used in trade data (COMTRADE and GSO statistics). A given sector is then classified as a net exporter or a net importer according to trade flows in 2002. Sectors that could not be matched with the trade data (mostly services) are classified as non-traded. The sector classification is given in table A3.

Household members also report whether they are wage earners or self employed. The latter category is divided between self-employed working on farm and those working in non-farm activities. Unfortunately due to the questionnaire design, the answers are not exclusive. For instance, among 133 individuals who worked in aquaculture, 32 reported themselves as wage earners, 84 as self-employed and 17 declared themselves both wage earners and self employed.

³ The household questionnaire collects information on household composition, expenditures (disaggregated by types), sources of income, employment and labor force participation, education (literacy, highest diploma, fee exemption), health of (use of health services, health insurance), housing (type of housing, electricity, water source, toilet), assets and durable goods and participation in poverty programs.

⁴ The panel linkage dataset was provided by Brian McCraig. The one provided by the statistical institute (GSO) showed some inconsistencies.

We thus define four categories: i) wage earners ii) self-employed on farm iii) self-employed in non-farm activities and iv) “multi-activity”. The latter includes all combinations of the former categories: being a wage earner and self-employed on farm; being a wage earner and self-employed in non-farm activities; being self-employed both on farm and out of the farm, etc. As a robustness check, we test an alternative grouping where categories are allowed to be non exclusive (section 7).

As no data relate directly farmers’ production to external trade, we use the detailed list of crops grown on farm, as well as their share in total harvest and in total marketed output, and relate them to trade statistics (COMTRADE and GSO). Hence, crops are classified as export-oriented, import-competing or non-traded internationally (those are subsistence crops, often retained for own consumption). Among export crops, we further distinguish the main export crops which represent the bulk of Vietnam agricultural exports (such as tea, coffee, rubber, pepper and cashew).⁵ Rice, the main staple in Vietnam, is classified as a category on its own, as it is at the same time, exported, imported, locally consumed and retained for own consumption.

We are quite confident that households who grow main export crops are indeed mostly producing for international markets. Coello (2009) has shown that in 2002, cash crop producers sold on average more than 78% of their harvest, while households growing subsistence crops sold only 30% of their harvest, retaining the rest for own consumption. The corresponding share for rice producers is even lower, at 24% on average.

Consumer price index

Expenditures are deflated using an index that we have computed specifically. We start from regional and monthly indices of the cost of living, so as to take into account the spatial and time variation that occurred during the period the survey was conducted.⁶ The structure of expenditures and hence, the cost of living differ according to the position of a given household in the income distribution. Thus the shares of food and non-food consumption in the consumer price index differ by expenditures quintiles.

4. The method

Poverty

⁵ Harvests are valued in Vietnamese dong, following Coello (2009) and Brandt, Benjamin and Coello (2009).

⁶ The regional and monthly consumer price indices were provided by Loren Brandt.

We use the concept of absolute poverty. Households are defined as poor if their real per capita expenditure is lower than the official poverty line.⁷ The Foster-Greer-Thorbecke (FGT) class of poverty indices writes:

$$FGT_{\alpha} = \frac{1}{N} \sum_{i=1}^N I(x_i < z) \left[\frac{z - x_i}{z} \right]^{\alpha}$$

where N is the population size, z is the poverty line, x_i the per capita expenditures of the i th household, I a dummy variable that takes the value of one if the condition is true and zero otherwise and α a poverty aversion parameter.

The headcount ratio represents the share of poor in total population. It is a particular case of the FGT index, where α is set to 0. Hence, it does not take into account the degree of poverty, and will not be affected by a policy that would further impoverish the poor. We also examine the severity of poverty, that is, the FGT index with $\alpha=2$ (also named the squared poverty gap) that puts a greater weight on the poorest and is sensitive to the distribution below the poverty line.⁸

We also look at poverty dynamics: a household can be either poor or not poor in 2002 and transit in or out poverty in 2004 and in 2006. The panel dataset provides a rare opportunity to compute these poverty transitions.

Econometric analysis

The econometric framework relates real per capita expenditures to households and local districts' characteristics as well as trade-related contextual variables. We estimate a linear regression on panel data, in a reduced form, such as:

$$\Delta Y_{it} = \alpha + \rho_i + \beta X_{it} + \gamma Z_{ct} + \delta \Delta(V_{it}) + \varepsilon_{it}$$

where Y_{it} is the level of real per capita expenditure of household i in year t , ΔY_{it} its change between 2002 and 2004, or 2004 and 2006. ρ_i is a household fixed effect, X_{it} are household variables that do not vary over time and control for initial endowments, Z_{ct} is a vector of districts controls (that can be seen as the endowment in public goods). V_{it} are the contextual variables that

⁷ In 2002 the official poverty line was set at 1,916,000 Dongs; in 2004, at 2,077 000 Dongs and in 2006 at 2,559 000 Dongs.

⁸ Another usual index is the poverty-gap (FGT with $\alpha=1$), which represents the share of income needed in order to bring all poor at the level of the poverty threshold. Poverty gap provides similar results (not reported here).

vary over time and relate to households' sources of income (type of occupation, sector, and crops grown).

Regressions are performed first on the whole population of the panel dataset, and next, specifically on farmers.⁹ Contextual variables are first introduced *per se* (job types and sectors separately), then, as interacted variables (*e.g.* “wage earners working in export industries”).

The continuous approach, with the change in expenditures as the dependent variable, allows studying the impact of trade liberalization (here, taken as the change in the level of trade-related contextual variables). However, it assumes the same coefficients throughout the distribution. Thus, we also run the continuous regression on a sample restricted to households who were poor in 2002.

Table 2 details the variables and gives some descriptive statistics, with variables considered as the base category in the regression marked in parenthesis. Trade-related variables at the household level might of course be linked to other household characteristics. However, it is not in a linear and simple way. Table A4 shows households' sector and job types by the level of education of the household head (as a proxy for each household member's education). As could be expected, households with a majority of members earning wages are better educated (53.6% of household head have more than a primary education). However, households specialized in self-employed non-farm activities are not far below (47%). Regarding sectors, households with a majority of members in non-traded services are the most educated; households in import industries and agriculture share the same polarized pattern with respect to education of the head: they have either more than a primary education or on the contrary have not even completed primary education. Surprisingly, households specialized in export industries are the less skilled of all.

Robustness

We perform various robustness checks. First, we regress the change in expenditures to the *level* of all variables in 2002, including the contextual ones. We have also mentioned in the previous section, a second robustness check, which consists in changing the classification of job types and allowing them to be non exclusive (the “multi-activity” category disappears).¹⁰

A third robustness check uses a discrete regression, with poverty transitions as the dependent variable. This discrete form is usual in the literature and allows different coefficients depending on the

⁹ We also ran the same estimations on farmers controlling for the type of crops grown (such as cereals, fruits, annuals, perennials and vegetables). Results are similar and can be provided on request.

¹⁰ Regressions (not presented in the paper) were also performed without any contextual variables and generated similar results for the household and location characteristics.

poverty status. However, results may not be robust to a change in the level of the poverty line itself or to measurement errors that are frequent in household surveys (Glewwe 2005, Glewwe and Hoang Dang 2005). Moreover, crossing the poverty line changes the headcount, and hence, the type of transition, despite the fact that it could not mean much for the actual household (Ravallion 1996). That explains why our preferred specification is the continuous one.

In the discrete approach, we use a multinomial logit regression on the probability of staying, exiting or entering into poverty. The multinomial logit model states that the probability that a household i is in state k is given by:

$$P_{ik} = \frac{\exp(\beta_k x_i)}{\sum_{j=1}^4 \exp(\beta_j x_i)}$$

We examine the poverty transitions between 2002 and 2004 and between 2004 and 2006. The unordered choices (k) are (1) being poor in each period, (2) being non-poor in the first period and becoming poor in the second, (3) being poor in the first period and becoming non-poor in the second, and (4) being non-poor in both periods. Here again, we relate the multinomial logit to household and community characteristics as well as trade-related variables.

5. Household consumption and poverty in Vietnam, 2002-2006

Figures 2 to 4 show the distribution of household expenditures per capita in Vietnam, in 2002, 2004 and 2006. The curves shifted to the right, especially between 2004 and 2006, the more so for food expenditures.

Table 3 displays the poverty indices computed on household expenditures in Vietnam. Between 2002 and 2006, the poverty incidence (P0) has been halved: 15.5% of the population are below the poverty line in 2006 compared to 30% in 2002 (first line). The corresponding headcounts in the 1990s were 58% in 1993 and 37% in 1998 (Glewwe et al. 2002). The drop in poverty in Vietnam over 20 years is indeed of a significant scale.

Most of the drop in poverty in the 2002-2006 period occurred between 2002 and 2004. The severity of poverty (P2) also drops by half in 2002-2006, down to 1.28% in 2006. In the 1990s, the severity of poverty was 7.9% in 1993 and dropped to 3.5% in 1998. Most of the drop in the 2002-2006 period occurred during the first two years.

The incidence of poverty is higher in rural areas (18.3% in 2006, second line) than in urban areas (4.7% in 2006).¹¹ Poverty decreased in both types of areas, and more in 2002-2004.

Vietnamese regions (figure A1) are historically very different: the South has been inhabited by Northern pioneers and was deeply influenced by the French and the American. Thus, regional differences mattered for economic growth in the 1990s (Brandt and Benjamin (2002); Coello (2008)). As regards poverty incidence, the poorest regions in 2002 were the North West (57% of the population were below the poverty line) and Central Highlands (57.9%) followed by North Central coast (41.4%) and North East (38.9%). In 2006, the North West has still a poverty incidence of 40.2%, but the other regions, and especially, the Central Highlands, have experienced a tremendous drop in poverty. This can be related to the specialization of Central Highlands in cash crop production (Benjamin et al. 2009, Coello 2009). The Central Coast in general and North Central Coast in particular is often affected by natural disasters, for instance, in 2005 by the Kai-Tak typhoon.¹² As a result, the headcount decreased only slightly between 2004 and 2006 in North Central Coast and in the North East, and increased slightly in the South East. The severity of poverty even increased in 2004-2006 in the North Central Coast.

Poverty seems also related to low education, being in a household whose head is a woman and being from an ethnic minority. As regards activity, poverty is linked to being a farmer, growing main export crops (coffee, cashew, nuts, tea, pepper), as well as import-competing crops or rice. Again, poverty drops most among farmers growing export crops. It also dropped hugely for households in non-traded services, while it actually increased in 2004-2006 for households involved in import competing industries. These descriptive correlations seem to be in line with the expected effects of trade liberalization.

What is more unintuitive, is that the distribution among the poor matters. Poverty incidence decreased from 19 % in 2002 to 13% in 2006 for households working in export industries. However, the same households saw the severity of poverty increase in the meantime, from 0.6% in 2002 to 1.5% in 2006, particularly in 2004-2006. Households working in import industries also saw the severity of poverty slightly increase during this period.

Table 4 shows the transitions in and out poverty during 2002-2006. Almost 13% of the population remains poor during the four years under study (third line). At the other extreme, “permanent” non-poor represent more than 71% of the panel households. The share of transitions out of poverty (11.2%) is more than double the share of transition into poverty (4.3%). In the 90s, for the

¹¹ Comparable figures in 1993 are 66.4% in rural areas and 25.5% in urban areas (resp. 45.5% and 9.2% in 1998).

¹² At least 19 people were killed and 10 others were left missing, the damages from the storm were estimated to be at least \$11 million (2005 USD) (Source Emergency Events Database EM-DAT).

period 1993-98, Glewwe and al. (2002) found that 28.7% of the population was “permanent” poor; 39% were “permanent” non poor, 27.4% exited poverty and 4.8% entered into poverty. Hence, in the 2000s, most of the population has escaped poverty “permanently” at least in a four-year period. However, the share of “permanent” poor is not negligible, and the share of entry into poverty is quite constant in the 1990s and in the 2000s. And there is still a huge discrepancy between rural and urban areas (lines 10 and 11). 91% of urban households stay out of poverty during the period, while only 61% of rural households did so. 5% of rural households entered into poverty while it was the case for only 1.6% of urban households.¹³

The percentage of households going out of poverty decelerates in 2004-06 (8.4%) compared to 2002-04 (14.1%). The share of poor households staying in poverty dropped also from 15.3% in 2002-04 to 10.7% in 2004-06.

As a sensitivity test, we set the poverty line 10% above and below the official level. With a poverty line higher by 10%, only 11.2% of households exit poverty in 2002-04 instead of 14.1%. The difference is smaller by 1.5% in 2004-2006. Alternatively, with a poverty line lower by 10%, the poverty exit rate is similar in 2002-04, and increase by two percentage points in 2004-06. These results indicate that between 2002 and 2004, individuals were just above the official poverty line: with a threshold 10% higher, the probability of exit drops significantly while when the threshold is lower by 10% nothing happens. In 2004-2006, on the opposite, households are equally distributed around the poverty line.

Figure 5 shows the kernel distribution of the relative distance of the per capita expenditure of the poor (in logarithm) to the poverty line. The relative distance to the poverty line is constructed exclusively on poor households. Within the poor, we measure the absolute difference between the households’ expenditure per capita and the official poverty line, divided by the official poverty line. The curve clearly shifts to the right in 2002-2006, meaning that the poor are moving farther below the poverty line. In other words, and in contradiction with the picture given by the headcount index alone, the poor in 2006 are less well off than the poor in 2002.

6. Trade liberalization and change in household expenditures

We now turn to the determinants of the expenditure growth in 2002-06 (table 5). The summary table below gives the main results.

¹³ The corresponding figures for rural areas in the same years (Justino and Lichfield 2003) were respectively, 33.9% (permanent poor), 31.1% (permanent non poor), 29.7% (out of poverty) and 5.4% (into poverty).

	variables that increase per capita household expenditure	variables that decrease per capita household expenditure
household Characteristics	share of adult female share of adult male being married household head is a woman household head has a primary education household head has a secondary education	large household size number of children being of an ethnic minority
location Characteristics	living in a city living in South East living in Mekong River village has access to electricity	living in the North Central region
farm characteristics	share of land with a land-right certificate	
Trade-related variables		
1. job types	nb of persons working in export industry nb of persons working in import competing industry nb of persons working in services	
2. sectors		nb of wage earners ^a nb of self-employed in non farm activities ^a nb of multi-activity job holders
3. sectors*job types	wage earners in services ^b	wage earners in import competing industries ^b
4. farm characteristics	being a rice net producer with a large plot large plot size share of main export crops share of subsistence crops	being a rice net producer

Notes: ^a positive when variables interacted with sector are added. ^b positive only for farmers.

With respect to household characteristics, the estimation results are in line with the descriptive statistics and with previous studies for the period 1993-98. The number of adults (male and female) has a positive impact on the increase in per capita expenditure between 2002 and 2006, contrary to the number of children. Being married is associated positively with income change, while belonging to an ethnic minority (non Kin) is negatively linked to income change. Other variables are less intuitive: having a woman as a household head, or having only completed primary education are associated positively with income changes. This positive effects could be related to the extent of overall growth in Vietnam which gave a chance to everybody. Location characteristics are also understandable: North Central region (hit by the typhoon) is associated with a negative income change, while the South (South East and the Mekong River) is associated with a positive income change. On the subsample of

farmers, an increase in expenditure is associated with formal ownership (a larger share of land protected by a formal title of property) and with crops diversification.

We now turn to the effect of the change in trade-related contextual variables. As expected, households with a larger number of persons working in export manufacturing industries, or farmers who have increased their specialization in export crops experience a rise in per capita expenditure. However, it is also the case for households involved in import-competing manufacture, or non-traded-services, as well as for farmers producing subsistence (non-traded) crops. Rice is a special case, as every farmer grows some rice. Thus, being a net producer of rice is associated negatively to income change. However, if the rice net producer owns a large plot, he is likely to experience a rise in income. Hence, trade openness has a distributional impact in the rice sector, differentiating between large and small producers. Overall, it seems that the benefit of the general growth of the economy exceeded the differential sectoral impact entailed by trade openness. In that context, it is interesting to note that households who increased their participation in multi-activity jobs experienced a decrease in their consumption growth. Thus, some specialization was needed to reap the benefits of overall growth, at least for the population as a whole.

When we restrict the analysis to households who were poor in 2002, the picture is somewhat different (table 6). The main results of the determinants of the consumption of the poor are presented in the summary table below, which also highlights the differences in the determinants of the consumption of the poor, compared to those of the general population.

Regarding household characteristics, gender seems to matter specifically on the consumption of poor households: having a larger share of adult female in the family is now clearly negatively correlated with expenditures; and having a woman as a household head has no longer a significant positive impact. Concerning the type of jobs, poor benefit indeed, as the total population, from export oriented industry and agriculture. However, for them, having some members earning wages is clearly linked to a decrease in income per capita (though the impact is still negative, but not significant anymore when variables interacting wage earnings and sector are added). In addition, poor farmers benefit not only from export crops, but also from import-competing crops (such as maize), which was not the case for the average household. Interestingly enough, even on the subsample of poor households, being a net producer of rice is still associated negatively to income. What matters for income change is the size of the plot. Finally, poor households benefit from being not specialized in one type of jobs and pursuing part-time multiple activities, contrary to the ordinary household in the total population.

	variables that increase per capita household expenditure of the poor	variables that decrease per capita household expenditure of the poor
household characteristics		large household size

	share of adult male (<i>being married</i>) (<i>household head is a woman</i>) household head has a primary education household head has a secondary education	share of adult female * number of children being of an ethnic minority
location characteristics	(<i>living in a city</i>) ** living in South East living in Mekong River village has access to electricity and communication	living in the North Central region
farm characteristics	share of land with a land-right certificate nb of crops (crop diversification)	
Trade related variables 1. job types	nb of self-employed in non farm activities ^a * nb of multi-activity job holders ^a *	nb of wage earners ^b
2. sectors	nb of persons working in export industry (<i>nb of persons working in import competing industry</i>) nb of persons working in services	
3. sector*job types	(<i>wage earners in services</i>)	(<i>wage earners in import competing industry</i>)
4.farm characteristics	(<i>being a rice net producer with a large plot</i>) plot size share of main export crops (<i>share of subsistence crops</i>) share of import competing crops *	being a rice net producer

Notes:

bold and * : sign changes when poor compared to total population.

italics and in parenthesis : not significant anymore in the subsample of the poor, compared to total population.

^a positive when variables interacted with sector are added.

^b : not significant when interacted variables are added

The picture that emerges from the econometric exercise is more complex than what a simple trade theory would predict. Indeed, exports both in industry and in agriculture matters. But poverty is not directly alleviated by the rise of a formal wages sector in for instance textile industry. As most of the poor are in rural areas and rely on agriculture, they benefit from market opportunities for the crops they produce as well as from new job opportunities in rural areas, such as transport or trading, in which they can involve on a part-time basis.

7. Robustness analysis

The first robustness check replicates the main regression, on all variables as of 2002 (table A5). Contextual variables are not anymore taken as changes between 2002 and 2006, but simply as their levels in 2002. Thus in this regression, we test how much the initial exposure to trade explains later performances. Actually, initial characteristics explain little of the subsequent change in expenditures: the R-squared drops from 54% in table 5 to 5%. Most contextual variables change sign even though they are not anymore significant. Working in the export industry in 2002 has a significant negative impact on subsequent consumption change. There are only two exceptions. First a specialization in main export crops still benefit farmers. Second, farmers involved in multi-activity jobs experience a decrease in their consumption growth. What can be inferred from this exercise is that the change in job opportunities in Vietnam during 2002 and 2006 in a broad sense (job types and sectors) was so significant that it has somewhat leveled the playing field. Initial positions in 2002 did not matter in determining subsequent income gains.

A second robustness check consists in running the main estimation with an alternative definition of the types of jobs that allow for overlaps: an individual can be counted twice in two different categories (table A6). Results are similar to table 5 when no interacted variables are added. When the latter are added, the positive effect of self-employed non-farm activities attenuates. In parallel, wage jobs (but now, possibly mixed with self-employed profits) appear as having a strong positive impact, in any sector. Earning wages in import-competing industries and in services is positive for all households and not only for the sole farmers as in the main estimation. And wage jobs in export industry have now a positive impact for farmers. These results add to the point made above, of the complementing role of part-time activities.

The third robustness analysis examines the determinants of poverty transitions (table A7). In the multinomial logit, all results are given relative to the base category, which is a household who stays poor in both periods. Among the three poverty transitions, we will be particularly interested in the transition out of poverty of households who were initially poor. This transition compares quite well to the evolution of households who were poor in 2002, examined in table 6, even though they concern both the 2002-04 and the 2004-06 transitions. This notwithstanding, the main results of the transition out of poverty is presented in the summary table below.

	variables that increase the probability of escaping poverty	variables that decrease the probability of escaping poverty
household characteristics	share of adult male household head has a primary education household head has a secondary education	share of adult female share of children being of an ethnic minority
location characteristics	living in the South East	living in the North Central Coast

	living in Mekong River village has bus, train or water transport	
farm characteristics	crop diversification	
Trade related variables		
1. job types		nb of wage earners
2. sectors	nb of persons in services	
3. sector*job types	nb of persons working as wage earners in services nb of persons working as wage earners in import competing industry	
4.farm characteristics	large plot share of main export crops share of rice share of import competing crops	

The determinants of the transition out of poverty fit quite well with the determinants of consumption growth of poor households. In both specifications, the share of adult male in the household, the education of household head (primary or secondary education) or living in the southern region (South East or Mekong river) are associated either with consumption growth or with a transition out of poverty. On the contrary, the share of adult female, the share of children, being of an ethnic minority, living in the North Central coast either impact negatively consumption growth or decrease the chance of escaping poverty.

The contextual variables give also similar results in both specifications. The number of wage earners in the family decrease the probability of escaping poverty, a paradoxical result already noted in the main estimation with poor's consumption growth as the dependent variable. More precisely, wage earnings in services and import-competing industries raise the chances of getting out of poverty. Farmers owning a large plot, growing main export crops or rice or even import-competing crops have also a higher chance of escaping poverty. Hence, the significance of import-competing crops on poverty alleviation that was stressed in the consumption regression seems confirmed here. What is not confirmed in the multinomial logit is the role of self-employed non-farm activities and multi-activity jobs in the transition out of poverty. Coefficients have the right sign but are no longer significant. Actually, these variables matter significantly for households who stayed out of poverty all the time.

8. Conclusion

Vietnam trade liberalization occurred in two sub-periods. The first stage corresponded to the initial opening of the country in the nineties. It has been crucial for poverty alleviation and has been

extensively studied. However this first stage of trade opening concerned mostly exports, while domestic production and import-competing sectors were largely unaffected. In this paper, we explore the impact of the second stage of trade liberalization in the 2000s, as Vietnam deepens its openness to foreign competition, because of its involvement in a network of reciprocal trade agreements and its accession to the WTO.

This paper shows the evolution of poverty in Vietnam during the deepening of trade liberalization and examines the impact of trade-related contextual variables, on occupational and crops choice, at the household level. Poverty decrease significantly during 2002 and 2006. However, this overall change hides a worsening of living conditions among the poor themselves especially in some regions (the North Central Coast) and some categories, among them, households involved in export and import industries.

In 2002-2006, Vietnamese households were impacted by external trade through different channels. First, as in the decade before, all activities (in industry as well as in agriculture) related to exports benefitted from trade openness. Moreover, unexpectedly, households involved in non-traded services and even in import-competing industry also gained.

Trade openness increased inequality among rice producers: it benefitted large producers, while it had a negative impact on small net producers. Farmers who intensified their specialization in the main exported crops (such as coffee, tea, cashew, pepper and rubber) obviously gained. But poor households also were better off if they were growing other crops such as maize, which was still protected at that time.

A robust and un-expected result is the negative effect of wage earnings *per se* on household consumption growth. The positive effect of trade openness on households did not occur through textbook channels such as the rise in (formal) unskilled wage jobs. Most households in Vietnam are still living in rural areas and working in agriculture. For them, poverty alleviation went through a rise in export crops production and a diversification of income sources, for instance, to non-farm self-employed (and often part-time) jobs. Wage earnings benefitted households not on all circumstances, but only depending on the sectors of employment. Last, besides exports, the import-competing sectors (in industry and in agriculture) played also a positive role in poverty alleviation. The latter channel could be hindered in the near future, as Vietnam is now in the process of decreasing its import protection.

TABLES

in percentage	2002	2004	2006	total
Majority of household members are:				
Wage earners	10.73	11.15	12.79	11.56
Self employed on farm	36.88	33.59	30.97	33.81
Self employed in non-farm activities	11.86	11.61	12.12	11.86
Multi-activity	40.52	43.66	44.12	42.77
Majority of household members in:				
Export industry	4.16	4.73	2.67	3.85
Import industry	3.39	2.98	4.67	3.68
Non traded industry and services	23.22	26.3	29.17	26.23
Agriculture	69.23	66	63.48	66.24
Majority of agricultural production in:				
Main export crops	6.21	6.63	5.8	6.21
Rice	48.38	47	49.46	48.28
Non-traded crops	8.47	8.73	5.29	7.5
Import-competing crops	8.53	9.86	9.19	9.19
Other export crops	28.4	27.79	30.25	28.81

Table 1. Employment and sector patterns

Note : the column for each category sums to 100.

Name	Definition	Mean	Std. Dev.	Nb of obs
consumption growth	Log of real per capita expenditure	8.242	0.652	5841
Red River Delta		0.191	0.393	5841
(North East)		0.146	0.354	5841
North West		0.042	0.201	5841
North Central Coast		0.125	0.331	5841
South Central Coast		0.099	0.298	5841
Central Highlands		0.065	0.246	5841
South East		0.117	0.321	5841
Mekong River Delta		0.215	0.411	5841
household size	log hsld size	1.418	0.402	5841
age of household head	log head age	3.825	0.293	5841
adult female	Share female 18-60	0.282	0.162	5841
adult male	Share male 18-60	0.269	0.169	5841
children	Share children under 18	0.372	0.229	5841
ethnic minority	=1, 0 otherwise	0.149	0.356	5841
married	=1, 0 otherwise	0.828	0.377	5841
woman as head	=1, 0 otherwise	0.218	0.413	5841
urban	=1, 0 otherwise	0.210	0.407	5841
	(No education)	0.326	0.469	5841
primary education	primary education	0.254	0.435	5841
secondary education	secondary and upper education	0.420	0.494	5841
daily market	=1, 0 otherwise	0.415	0.493	4596
post office	=1, 0 otherwise	0.419	0.493	4596
transport	Bus, train water transport (=1, 0 otherwise)	0.396	0.489	4596
electricity	=1, 0 otherwise	0.943	0.232	5745
land rights	Share of land with certificate in 2004	0.713	0.406	5607
crop diversification	log of number of crops	1.482	0.826	4162
distance to plot	distance to the agricultural plot	6.308	1.374	4146
	(share of other export in harvest value)	0.142	0.218	4162
main export crops	harvest share of main export crops	0.076	0.232	4162
rice	harvest share of rice	0.545	0.369	4162
subsistence crops	harvest share of subsistence crops	0.115	0.207	4162
import crops	harvest share of import competing crops	0.121	0.211	4162
(agriculture)	(nbr pers in agriculture)	1.501	1.441	5841
export	nbr pers in export industry	0.180	0.549	5841
import	nbr pers in import-competing industry	0.171	0.522	5841
services	nbr pers in non-traded services	0.740	0.981	5841
	(nbr pers only self-employed on farm)	1.069	1.275	5841
wage earners	nbr of wages earners	0.451	0.845	5841
non farm self- employed	nbr pers of non-farm self-employed	0.270	0.649	5841
multi-activity	nb of pers earning wages and self-employed	0.804	0.964	5841
plot size*rice	total area*producer of rice	10645	18391	4085
rice net producer	=1 if hsld is net producer of rice, 0 otherwise	0.585	0.493	5841
plot size	log of the agricultural area	8.738	1.327	4072

Table 2 : Variables definition and statistics

in percentage	2002		2004		2006	
	P0	P2	P0	P2	P0	P2
All	29.38	2.50	19.05	1.61	15.46	1.28
Rural	34.83	2.97	22.68	1.93	18.32	1.55
Urban	8.82	0.74	5.39	0.39	4.66	0.27
Red River Delta	21.77	1.21	12.37	0.57	8.06	0.51
North East	38.95	3.21	25.96	2.16	24.91	1.73
North West	57.32	9.90	52.44	6.43	40.24	5.11
North Central Coast	41.39	2.75	26.64	2.16	25.00	2.27
South Central Coast	22.40	1.61	15.10	1.68	11.98	0.88
Central Highlands	57.94	7.36	35.71	4.21	25.40	3.30
South East	15.42	1.15	5.73	0.56	6.17	0.46
Mekong River Delta	19.33	1.27	13.37	0.64	8.83	0.38
no diploma	40.16	4.50	31.34	3.27	26.30	2.42
Primary	30.71	2.30	19.60	1.24	14.75	1.32
secondary and upper	20.20	1.08	9.18	0.54	7.47	0.38
Kinh	22.69	1.33	12.98	0.70	10.32	0.65
Ethnic minority	67.59	9.23	53.79	6.80	44.83	4.92
Consumer	15.50	1.20	10.71	0.63	8.75	0.62
Producer	38.53	3.36	24.91	2.30	20.62	1.80
Hsld head is a male	23.11	1.78	15.33	1.06	12.97	1.25
Hsld head is a female	31.12	2.71	20.09	1.76	16.15	1.29
Export industry	19.75	0.83	11.96	0.62	13.46	1.48
Import industry	9.09	0.55	3.45	0.40	7.69	0.57
Non-traded services	7.74	0.46	4.30	0.24	2.99	0.13
Agriculture	38.20	3.39	26.15	2.28	21.84	1.86
Wage earner	9.57	0.88	10.14	0.40	9.64	0.51
Self employed on farm	38.58	3.84	25.99	2.38	19.90	1.93
Self employed non-farm	8.66	0.37	3.54	0.21	1.27	0.03
Multi-activity	32.32	2.34	20.12	1.69	17.93	1.40
Main export crops	40.50	3.57	20.93	1.53	10.62	0.74
Rice	38.22	3.21	24.15	2.26	20.56	1.62
Non traded crops	18.18	1.70	14.12	1.04	11.65	0.79
Import-competing crops	38.55	3.87	28.13	2.41	22.35	2.85
Other export crops	12.48	0.90	8.32	0.42	6.62	0.44

Table 3. Poverty indices by socioeconomic characteristics

Note : P0 headcount P2 severity of poverty

	t	always poor	non-poor t poor t+1	poor t non-poor t+1	non-poor t non-poor t+1
Official Poverty Line	2002	15.25 (297)	3.8 (74)	14.12 (275)	66.82 (1301)
	2004	10.68 (208)	4.78 (93)	8.37 (163)	76.17 (1483)
	Total	12.97	4.29	11.25	71.49
Official Poverty Line +10%	2002	10.89 (212)	3.49 (68)	11.09 (216)	74.52 (1451)
	2004	7.45 (145)	4.26 (83)	6.93 (135)	81.36 (1584)
	Total	9.17	3.88	9.01	77.94
Official Poverty Line -10%	2002	20.13 (392)	4.31 (84)	15 (292)	60.55 (1179)
	2004	13.97 (272)	5.5 (107)	10.48 (204)	70.06 (1364)
	Total	17.05	4.9	12.74	65.31
	Rural	15.50	5.01	13.26	66.24
	Urban	3.43	1.60	3.68	91.30

Table 4. Poverty transitions

Note: The year reported on the second column is the initial year of the transition. Thus row one shows the transition from year 2002 to year 2004 and row two from year 2004 to year 2006. A row sums up to 100. Number of households in each category is in parenthesis.

	1	2	3	4	5	6	7	8
	all	farmers	farmers	all	farmers	farmers	farmers	farmers
Red River Delta	-0.00854 [0.0322]	-0.0292 [0.0364]	0.00429 [0.0365]	0.0108 [0.0330]	-0.00727 [0.0374]	0.026 [0.0374]	0.00845 [0.0369]	0.0234 [0.0372]
North West	-0.0786 [0.0479]	-0.016 [0.0530]	-0.0251 [0.0530]	-0.0642 [0.0492]	0.00213 [0.0546]	-0.00688 [0.0546]	-0.0378 [0.0541]	-0.0297 [0.0546]
North Central Coast	-0.139*** [0.0343]	-0.124*** [0.0387]	-0.0892** [0.0388]	-0.135*** [0.0353]	-0.132*** [0.0399]	-0.100** [0.0400]	-0.141*** [0.0393]	-0.119*** [0.0398]
South Central Coast	0.0407 [0.0376]	0.00909 [0.0459]	0.0375 [0.0460]	0.0698* [0.0385]	0.0425 [0.0472]	0.066 [0.0473]	0.0211 [0.0465]	0.041 [0.0471]
Central Highlands	0.0566 [0.0413]	0.137*** [0.0478]	0.0213 [0.0536]	0.0149 [0.0422]	0.0820* [0.0489]	-0.0364 [0.0549]	-0.0769 [0.0512]	-0.105* [0.0558]
South East	0.315*** [0.0360]	0.380*** [0.0519]	0.307*** [0.0540]	0.297*** [0.0371]	0.333*** [0.0532]	0.254*** [0.0553]	0.183*** [0.0550]	0.161*** [0.0573]
Mekong River Delta	0.220*** [0.0325]	0.380*** [0.0464]	0.403*** [0.0461]	0.200*** [0.0335]	0.332*** [0.0474]	0.352*** [0.0472]	0.185*** [0.0497]	0.198*** [0.0502]
household size	-0.186*** [0.0323]	-0.237*** [0.0399]	-0.243*** [0.0396]	-0.171*** [0.0331]	-0.202*** [0.0409]	-0.206*** [0.0406]	-0.180*** [0.0387]	-0.182*** [0.0386]
age of the head	0.241*** [0.0419]	0.223*** [0.0468]	0.233*** [0.0463]	0.235*** [0.0431]	0.231*** [0.0482]	0.241*** [0.0477]	0.219*** [0.0475]	0.220*** [0.0474]
female adults	0.114** [0.0577]	0.113 [0.0704]	0.114 [0.0697]	0.127** [0.0594]	0.147** [0.0725]	0.153** [0.0718]	0.122* [0.0716]	0.120* [0.0714]
male adults	0.329*** [0.0602]	0.358*** [0.0710]	0.372*** [0.0702]	0.353*** [0.0618]	0.385*** [0.0732]	0.398*** [0.0724]	0.354*** [0.0713]	0.362*** [0.0712]
children	-0.223*** [0.0650]	-0.157** [0.0738]	-0.138* [0.0730]	-0.255*** [0.0668]	-0.186** [0.0759]	-0.167** [0.0751]	-0.261*** [0.0754]	-0.261*** [0.0752]
ethnic minority	-0.224*** [0.0300]	-0.222*** [0.0332]	-0.194*** [0.0332]	-0.274*** [0.0305]	-0.251*** [0.0341]	-0.223*** [0.0340]	-0.270*** [0.0337]	-0.253*** [0.0339]
married	0.116*** [0.0329]	0.0916** [0.0426]	0.0940** [0.0422]	0.125*** [0.0339]	0.0855* [0.0439]	0.0861** [0.0435]	0.0843* [0.0433]	0.0843* [0.0432]
woman as head	0.0832*** [0.0283]	0.0254 [0.0397]	0.034 [0.0392]	0.0895*** [0.0291]	0.0244 [0.0409]	0.0315 [0.0404]	0.0377 [0.0402]	0.0432 [0.0401]
urban	0.300*** [0.0245]			0.320*** [0.0252]				
primary education	0.142*** [0.0240]	0.141*** [0.0271]	0.145*** [0.0268]	0.158*** [0.0246]	0.156*** [0.0278]	0.162*** [0.0276]	0.156*** [0.0274]	0.161*** [0.0274]
secondary education	0.363*** [0.0245]	0.303*** [0.0282]	0.300*** [0.0279]	0.391*** [0.0250]	0.333*** [0.0287]	0.332*** [0.0285]	0.329*** [0.0283]	0.327*** [0.0283]
daily market		0.000601 [0.0242]	-0.0008 [0.0240]		-0.000198 [0.0249]	0.000678 [0.0247]	0.00175 [0.0246]	0.000409 [0.0245]
post office		-0.0112 [0.0231]	-0.00271 [0.0229]		-0.0113 [0.0238]	-0.00433 [0.0236]	-0.00938 [0.0235]	-0.00438 [0.0235]
transport		0.015 [0.0225]	0.0156 [0.0222]		0.0296 [0.0232]	0.0298 [0.0229]	0.0119 [0.0228]	0.0112 [0.0227]
electricity		0.129*** [0.0429]	0.105** [0.0427]		0.143*** [0.0442]	0.117*** [0.0439]	0.145*** [0.0436]	0.126*** [0.0438]
land rights		0.106*** [0.0273]	0.110*** [0.0270]		0.110*** [0.0280]	0.116*** [0.0278]	0.124*** [0.0277]	0.122*** [0.0277]
crop diversification		0.0672*** [0.0190]	0.0632*** [0.0193]		0.0386** [0.0193]	0.0312 [0.0196]	0.00983 [0.0191]	0.00414 [0.0216]

	1 all	2 farmers	3 farmers	4 all	5 farmers	6 farmers	7 farmers	8 farmers
distance to plot		0.0158* [0.00812]	0.0146* [0.00804]		0.00935 [0.00834]	0.00885 [0.00827]	0.00942 [0.00836]	0.00719 [0.00836]
export	0.0786*** [0.0216]	0.123*** [0.0293]	0.126*** [0.0291]					
import	0.160*** [0.0253]	0.199*** [0.0302]	0.196*** [0.0299]					
services	0.209*** [0.0188]	0.192*** [0.0223]	0.193*** [0.0221]					
wage earners	-0.103*** [0.0192]	-0.0715** [0.0280]	-0.0746*** [0.0277]					
non farm self- employed	-0.129*** [0.0245]	-0.0132 [0.0478]	-0.00846 [0.0473]	0.0716*** [0.0181]	0.184*** [0.0429]	0.186*** [0.0425]		
multi-activity	-0.113*** [0.0143]	-0.0695*** [0.0149]	-0.0617*** [0.0149]	-0.0411*** [0.0131]	-0.00427 [0.0134]	0.00405 [0.0134]		
wage*export				-0.021 [0.0163]	0.0335 [0.0307]	0.038 [0.0303]		
wage*services				0.00487 [0.00890]	0.0776*** [0.0223]	0.0786*** [0.0221]		
wage*import				-0.0428*** [0.0133]	0.0836*** [0.0306]	0.0807*** [0.0303]		
plot size*rice producer							0.0269*** [0.00910]	0.0276*** [0.00909]
rice net producer							-0.314*** [0.0393]	-0.267*** [0.0558]
plot size							0.0590*** [0.0141]	0.0594*** [0.0146]
main export crops	0.365*** [0.0774]			0.311*** [0.0795]			0.188** [0.0810]	
rice	0.0202 [0.0543]			-0.0393 [0.0556]			0.0265 [0.0682]	
non-traded crops	0.183** [0.0778]			0.149* [0.0802]			0.211*** [0.0799]	
import crops	0.0764 [0.0761]			-0.000881 [0.0783]			-0.0136 [0.0781]	
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Commune Controls	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Crops' Orientation	No	No	Yes	No	No	Yes	No	Yes
Observations	5841	3514	3514	5841	3514	3514	3514	3514
nb of households	1947	1222	1222	1947	1222	1222	1222	1222
R-squared	0.541	0.495	0.51	0.515	0.465	0.479	0.476	0.482

Table 5. Determinants of consumption growth (2002-2006)

Note : dependent variable : real per capita expenditures. A * (resp ** and ***) show significance at 90% (95%, 99%) of confidence. Standard errors in brackets.

	1	2	3	4	5	6	7	8
	all	farmers	farmers	all	farmers	farmers	farmers	farmers
Red River Delta	-0.0643 [0.0426]	-0.0573 [0.0484]	-0.0187 [0.0484]	-0.0548 [0.0431]	-0.0375 [0.0488]	-0.000972 [0.0491]	-0.036 [0.0480]	-0.0097 [0.0489]
North West	-0.0619 [0.0455]	-0.0283 [0.0520]	-0.0378 [0.0514]	-0.0582 [0.0460]	-0.0184 [0.0524]	-0.029 [0.0519]	-0.0393 [0.0516]	-0.0396 [0.0523]
North Central Coast	-0.117*** [0.0389]	-0.110** [0.0450]	-0.0707 [0.0454]	-0.121*** [0.0393]	-0.106** [0.0456]	-0.069 [0.0462]	-0.121*** [0.0448]	-0.0895* [0.0460]
South Central Coast	-0.0442 [0.0511]	-0.0272 [0.0591]	0.0199 [0.0591]	-0.0247 [0.0514]	-0.0147 [0.0600]	0.0306 [0.0601]	-0.0124 [0.0591]	0.0324 [0.0604]
Central Highlands	0.00368 [0.0412]	0.0412 [0.0510]	-0.0322 [0.0555]	-0.0162 [0.0416]	0.024 [0.0512]	-0.0468 [0.0560]	-0.0422 [0.0527]	-0.0552 [0.0562]
South East	0.101* [0.0533]	0.190** [0.0772]	0.123 [0.0793]	0.0839 [0.0540]	0.160** [0.0788]	0.098 [0.0814]	0.105 [0.0784]	0.102 [0.0822]
Mekong River Delta	0.100** [0.0452]	0.149** [0.0688]	0.179*** [0.0687]	0.0761* [0.0461]	0.132* [0.0686]	0.156** [0.0689]	0.0667 [0.0686]	0.106 [0.0702]
household size	-0.0518 [0.0454]	-0.0919* [0.0535]	-0.0946* [0.0523]	-0.0389 [0.0459]	-0.0704 [0.0539]	-0.0714 [0.0528]	-0.0905* [0.0532]	-0.0778 [0.0533]
age of the head	0.0597 [0.0464]	0.00522 [0.0522]	-0.0118 [0.0515]	0.0513 [0.0468]	0.00618 [0.0527]	-0.00892 [0.0522]	0.013 [0.0521]	0.00274 [0.0519]
female adults	-0.173** [0.0875]	-0.141 [0.107]	-0.137 [0.105]	-0.178** [0.0885]	-0.145 [0.109]	-0.143 [0.107]	-0.147 [0.108]	-0.141 [0.107]
male adults	0.109 [0.0949]	0.252** [0.108]	0.226** [0.106]	0.117 [0.0961]	0.268** [0.110]	0.241** [0.108]	0.245** [0.107]	0.247** [0.107]
children	-0.134* [0.0806]	-0.0291 [0.0927]	-0.0341 [0.0905]	-0.133 [0.0818]	-0.0328 [0.0939]	-0.0393 [0.0920]	-0.0711 [0.0932]	-0.0544 [0.0929]
ethnic minority	-0.194*** [0.0310]	-0.202*** [0.0361]	-0.183*** [0.0358]	-0.217*** [0.0309]	-0.213*** [0.0363]	-0.195*** [0.0361]	-0.227*** [0.0359]	-0.216*** [0.0362]
married	0.0192 [0.0493]	-0.0237 [0.0571]	-0.0268 [0.0557]	0.0229 [0.0496]	-0.0197 [0.0571]	-0.0219 [0.0559]	-0.0146 [0.0566]	-0.0197 [0.0561]
woman as head	0.0392 [0.0468]	-0.00598 [0.0555]	0.00233 [0.0542]	0.0459 [0.0472]	-0.0024 [0.0560]	0.00664 [0.0548]	0.00918 [0.0553]	0.0103 [0.0549]
urban	0.0591 [0.0462]	0 [0]	0 [0]	0.067 [0.0470]	0 [0]	0 [0]	0 [0]	0 [0]
primary education	0.0924*** [0.0281]	0.0852** [0.0331]	0.0804** [0.0324]	0.0985*** [0.0283]	0.0906*** [0.0334]	0.0866*** [0.0328]	0.110*** [0.0330]	0.101*** [0.0328]
secondary education	0.204*** [0.0304]	0.180*** [0.0345]	0.162*** [0.0341]	0.212*** [0.0307]	0.193*** [0.0347]	0.177*** [0.0345]	0.202*** [0.0343]	0.186*** [0.0345]
daily market		-0.0086 [0.0312]	-0.0198 [0.0306]		-0.000556 [0.0314]	-0.011 [0.0308]	0.0105 [0.0310]	-0.00166 [0.0309]
post office		-0.0483 [0.0296]	-0.0403 [0.0290]		-0.0446 [0.0301]	-0.0362 [0.0296]	-0.0531* [0.0295]	-0.0498* [0.0295]
transport		0.0289 [0.0290]	0.0369 [0.0285]		0.0349 [0.0293]	0.0435 [0.0288]	0.0394 [0.0283]	0.0464 [0.0282]
electricity		0.0992** [0.0403]	0.0973** [0.0396]		0.104** [0.0407]	0.103** [0.0402]	0.114*** [0.0401]	0.112*** [0.0402]
land rights		0.0819** [0.0396]	0.0886*** [0.0396]		0.0855*** [0.0396]	0.0905*** [0.0396]	0.0938*** [0.0396]	0.0961*** [0.0396]

	[0.0321]		[0.0315]	[0.0325]		[0.0320]	[0.0320]	[0.0321]		
	1 all	2 farmers	3 farmers	4 all	5 farmers	6 farmers	7 farmers	8 farmers		
crop diversification		0.0478*	0.0698**		0.033	0.0531*	0.0118	0.0373		
		[0.0277]	[0.0281]		[0.0276]	[0.0280]	[0.0282]	[0.0320]		
distance to plot		-0.000203	-0.00193		-0.00326	-0.00487	-0.0116	-0.0104		
		[0.0124]	[0.0121]		[0.0124]	[0.0121]	[0.0125]	[0.0124]		
export	0.0541*	0.124***	0.129***							
	[0.0310]	[0.0475]	[0.0467]							
import	0.00471	0.0122	0.00455							
	[0.0389]	[0.0447]	[0.0437]							
services	0.101***	0.0958***	0.0991***							
	[0.0281]	[0.0335]	[0.0326]							
wage earners	-0.0483**	-0.0578	-0.0278	-0.00875	-0.107	-0.0661				
	[0.0238]	[0.0387]	[0.0419]	[0.0326]	[0.0779]	[0.0806]				
non farm self- employed	-0.0383	0.104	0.109	0.0877**	0.208**	0.220**				
	[0.0506]	[0.0943]	[0.0921]	[0.0387]	[0.0888]	[0.0871]				
multi-activity	0.0177	0.0122	0.0143	0.0337**	0.0294*	0.0320*				
	[0.0159]	[0.0176]	[0.0174]	[0.0151]	[0.0168]	[0.0166]				
wage*export				0.0286	0.0311	0.0245				
				[0.0391]	[0.0565]	[0.0572]				
wage*services				-0.00118	0.0716	0.0722				
				[0.0140]	[0.0645]	[0.0631]				
wage*import				-0.0193	0.0484	0.0186				
				[0.0271]	[0.0633]	[0.0628]				
plot size*rice producer									0.00174	0.00356
									[0.0121]	[0.0120]
rice net producer			-0.164***				-0.140*			
						[0.0584]	[0.0786]			
plot size							0.0773***	0.0528**		
						[0.0203]	[0.0220]			
main export crops					0.401***		0.383***		0.287***	
					[0.100]		[0.102]		[0.106]	
rice			0.121			0.117		0.148*		
			[0.0761]			[0.0776]		[0.0858]		
non-traded crops			-0.142			-0.151		-0.0673		
			[0.165]			[0.173]		[0.160]		
import crops			0.217**			0.223**		0.209**		
			[0.0989]			[0.100]		[0.101]		
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Commune Controls	No	Yes	Yes	No	Yes	Yes	Yes	Yes		
Crops' Orientation	No	No	Yes	No	No	Yes	No	Yes		
Observations	1716	1322	1322	1716	1322	1322	1322	1322		
nb of households	572	450	450	572	450	450	450	450		
R-squared	0.331	0.367	0.403	0.315	0.35	0.384	0.36	0.378		

Table 6 : Determinants of consumption growth for initially poor households

Note : dependent variable : real per capita expenditures. Sample restricted to poor households in 2002. A * (resp ** and ***) show significance at 90% (95%, 99%) of confidence. Standard errors in brackets.

FIGURES

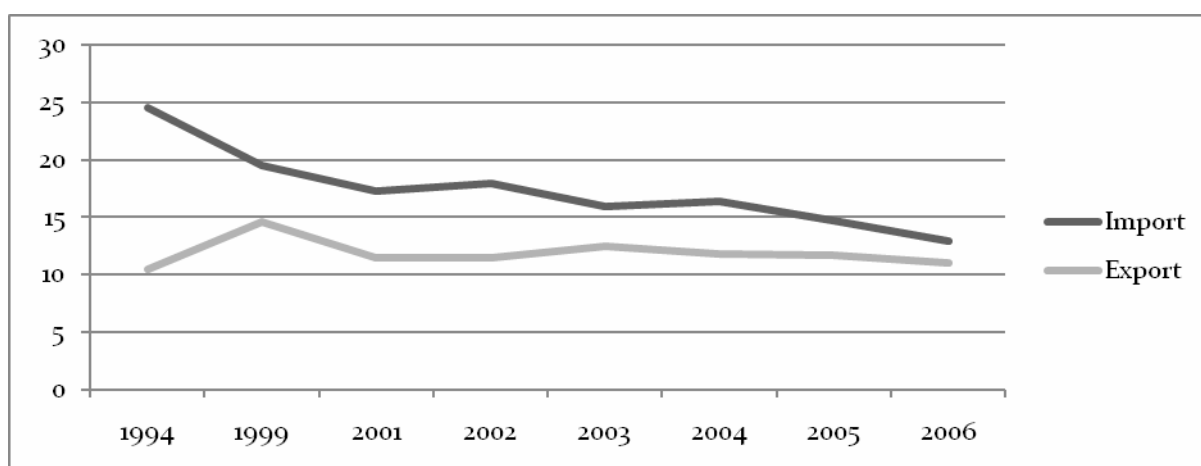


Figure 1. Weighted tariffs by type of products (Source TRAINS)

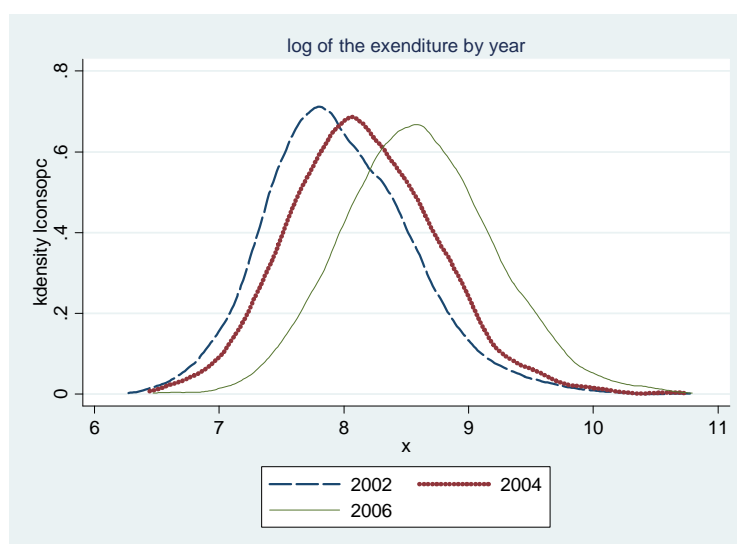


Figure 2. Kernel density function of the expenditure per capita by year

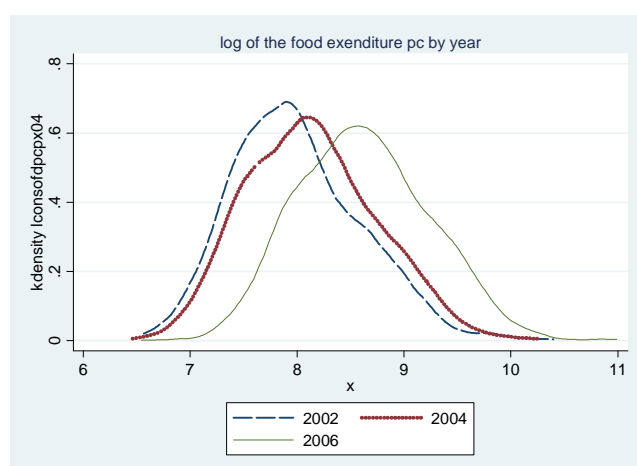


Figure 3. Kernel density function of the food consumption per capita by year

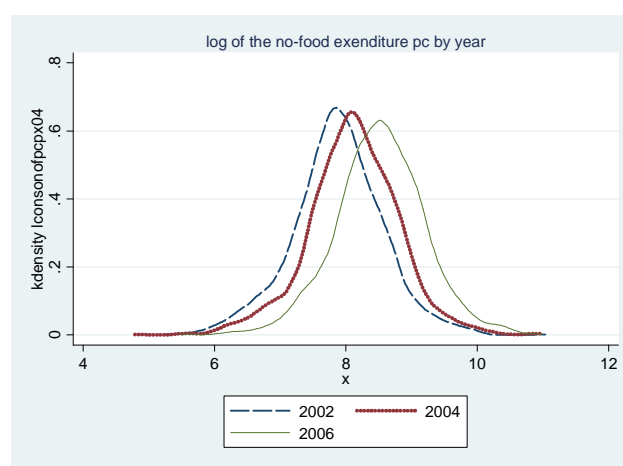


Figure 4. Kernel density function of the non food consumption per capita by year

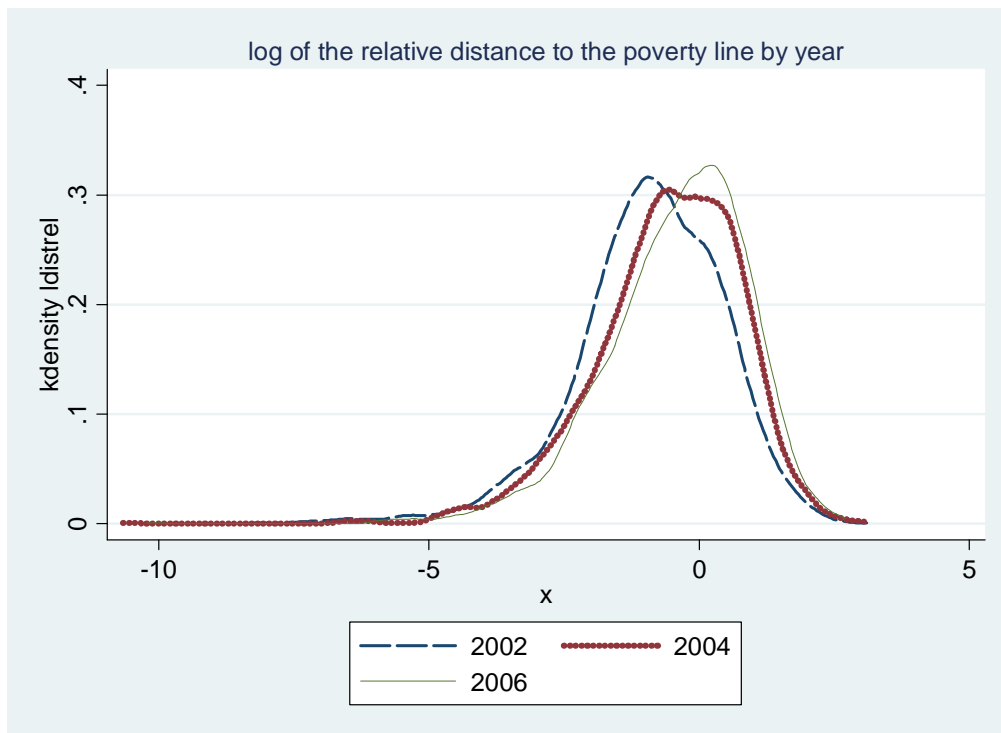


Figure 5. Kernel density function of the relative distance in log to the poverty line by year

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APPENDIX
Trade liberalization and poverty dynamics
in Vietnam 2002-2006

In percentage	2002		2004		2006	
	P0	P2	P0	P2	P0	P2
General Statistic Office	28.9		19.5		16.0	
VHLSS database						
total sample (cross-section)	28.4	2.5	18.8	1.6	15.5	1.3
panel sample	29.4	2.5	19.0	1.7	15.6	1.3

Table A1. Representativeness of the dataset in terms of poverty headcount (P0)
and poverty severity (P2)
Source: GSO and VHLSS

(in percentage)		2002	2004	2006
no education	Full sample	30.95	28.55	25.93
	Panel	30.99	29.92	28.12
primary	Full sample	23.75	24.45	24.89
	Panel	24.75	25.36	25.58
more than primary	Full sample	45.30	46.99	49.19
	Panel	44.26	44.73	46.31

Table A2. Household head's education.
Note : share of household heads with respectively, no, primary and more than primary education
The column for full sample (resp. panel) sums up to 100.

Industry Exports Fishing, aquaculture Mining of coal and lignite; extraction of peat Extraction of crude petroleum and natural gas Wearing apparel; dressing and dyeing of fur Footwear Wood and of products of wood and cork Office, accounting and computing machinery	Industry Non-traded Recycling Electricity, gas, steam and hot water supply Collection, purification and distribution of water Construction Sale, maintenance and repair of motor vehicles Wholesale trade and commission trade Retail trade, repair Hotels and restaurants Land transport; transport via pipelines Water transport Air transport Supporting and auxiliary transport activities Post and telecommunications Financial intermediation Insurance and pension funding Activities auxiliary to financial intermediation Real estate activities Renting of machinery and equipment Computer and related activities Research and development Other business activities Public administration and defence Education Health and social work Sewage and refuse disposal, sanitation Activities of membership organizations n.e.c. Recreational, cultural and sporting activities Other service activities Private households as employers Extraterritorial organizations and bodies	Agriculture Main Exports Black pepper Cashew, coffee Rubber, tea
		Exports Bananas Cassava manioc Coconut Cotton Cabbage, cauliflower Mango, Papaya Peanuts Pineapple Sesame seeds Soy beans Specialty rice Sweet potatoes
		Imports Apples, grapes Fresh vegetables Indian Corn Jackfruit, durian Jute, ramie Mulberry Oranges, limes Other leafy greens Plums, potatoes Sugar cane Tobacco Tomatoes
		Non-traded (subsistence) Custard apple Litchi, logan, rambutan Sapodilla Water morning glory
		Rice
Imports Forestry, logging and related service activities Mining of uranium and thorium ores Food products and beverages Tobacco products Textiles Tanning and dressing of leather; luggage Paper and paper products Coke, refined petroleum products and nuclear fuel Chemicals and chemical products Rubber and plastics products Other non-metallic mineral products Basic metals Fabricated metal products Machinery and equipment Electrical machinery and apparatus Radio, television and communication equipment Medical, precision and optical instruments Motor vehicles, trailers Furniture; manufacturing n.e.c.		

Table A3 : Sectors definition

	no education	primary	more than primary
Majority of household members in:			
Export industry	45.68	24.69	29.63
Import industry	33.33	28.79	37.88
Non traded industry and services	21.24	22.79	55.97
Agriculture	35.61	26.19	38.2
Total	32.61	25.42	41.96
Majority of household members are:			
Wage earners	25.84	20.57	53.59
Self employed on farm	35.65	27.3	37.05
Self employed in non-farm activities	28.14	24.68	47.19
Multi-activity	32.95	25.22	41.83
Total	32.61	25.42	41.96

Table A4 : Households' sector and education

	1	2	3
	all population	farmers	farmers
export	-0.0423** [0.0198]	-0.0361 [0.0310]	-0.0317 [0.0312]
import	-0.0202 [0.0235]	0.00181 [0.0324]	0.00541 [0.0324]
services	-0.0217 [0.0173]	-0.0194 [0.0230]	-0.0158 [0.0231]
wage earners	0.0161 [0.0183]	-0.0312 [0.0289]	-0.0317 [0.0288]
non farm self- employed	0.0271 [0.0223]	0.0477 [0.0435]	0.0445 [0.0435]
multi-activity	-0.0126 [0.0127]	-0.0243* [0.0141]	-0.0238* [0.0141]
main export crops			0.252*** [0.0940]
rice			0.0545 [0.0644]
non-traded crops			0.0674 [0.0825]
import crops			0.0997 [0.0850]
Demographic Controls	Yes	Yes	Yes
Commune Controls	No	Yes	Yes
Crops' Orientation	No	No	Yes
Observations	1947	1176	1176
R-squared	0.05	0.079	0.085

Table A5 : Determinants of consumption growth on variables levels in 2002

Note : dependent variable : real per capita expenditures. The regression includes the same variables as in table 6 but only contextual variables are reported in the table. A * (resp ** and ***) show significance at 90% (95%, 99%) of confidence. Standard errors in brackets.

	1	2	3
	all population	farmers	farmers
export	0.0690*** [0.0209]	0.116*** [0.0286]	0.116*** [0.0284]
import	0.141*** [0.0244]	0.177*** [0.0298]	0.169*** [0.0295]
services	0.186*** [0.0156]	0.182*** [0.0199]	0.179*** [0.0198]
wage earners	-0.102*** [0.0133]	0.0789*** [0.0146]	-0.0728*** [0.0145]
non farm self- employed	-0.0706*** [0.0155]	-0.0122 [0.0171]	-0.00169 [0.0170]
main export crops			0.366*** [0.0771]
rice			0.0189 [0.0540]
non-traded crops			0.196** [0.0775]
import crops			0.0784 [0.0757]
Demographic Controls	Yes	Yes	Yes
Commune Controls	No	Yes	Yes
Crops' Orientation	No	No	Yes
Observations	5841	3514	3514
nb of households	1947	1222	1222
R-squared	0.539	0.499	0.514

Table A6 : Determinants of consumption growth, with non-exclusive definition of employment categories

Note : dependent variable : real per capita expenditures. The regression includes the same variables as in table 6 but only contextual variables are reported in the table. A * (resp ** and ***) show significance at 90% (95%, 99%) of confidence. Standard errors in brackets.

	1	2	3	4	5	6
	np p	all p np	np np	np p	farmers p np	np np
Red River Delta	0.504* [0.182]	0.897 [0.245]	0.817 [0.193]	0.360** [0.155]	1.133 [0.370]	0.922 [0.265]
North West	1.1 [0.424]	1.056 [0.307]	0.590* [0.167]	1.003 [0.477]	1.215 [0.423]	0.943 [0.321]
North Central Coast	0.434** [0.143]	0.512*** [0.128]	0.302*** [0.0652]	0.235*** [0.0980]	0.555* [0.168]	0.301*** [0.0796]
South Central Coast	0.818 [0.328]	1.063 [0.333]	1.571* [0.416]	0.682 [0.342]	1.927* [0.732]	1.791* [0.592]
Central Highlands	0.372** [0.182]	1.327 [0.355]	0.964 [0.240]	0.818 [0.515]	2.323** [0.884]	1.748 [0.643]
South East	2.990** [1.401]	3.912*** [1.505]	8.343*** [2.909]	3.312* [2.316]	6.318*** [3.595]	13.58*** [6.927]
Mekong River Delta	1.234 [0.433]	1.861** [0.510]	3.500*** [0.828]	1.129 [0.623]	3.606*** [1.551]	7.676*** [2.903]

household size	0.320*** [0.115]	0.906 [0.261]	0.351*** [0.0859]	0.292*** [0.136]	0.807 [0.290]	0.353*** [0.110]
age of the head	1.818 [0.764]	1.256 [0.386]	4.564*** [1.241]	2.108 [1.051]	1.223 [0.445]	4.829*** [1.569]
female adults	0.408 [0.279]	0.320** [0.183]	1.072 [0.501]	0.275 [0.242]	0.192** [0.140]	0.569 [0.343]
male adults	5.921** [4.529]	2.408 [1.566]	19.19*** [10.69]	11.26*** [10.46]	5.705** [4.449]	26.80*** [18.39]
children	0.361 [0.255]	0.346** [0.182]	0.258*** [0.117]	0.26 [0.222]	0.303* [0.190]	0.240*** [0.131]
ethnic minority	0.305*** [0.0846]	0.372*** [0.0715]	0.168*** [0.0287]	0.293*** [0.101]	0.355*** [0.0847]	0.187*** [0.0401]
married	1.052 [0.388]	1.198 [0.348]	2.294*** [0.574]	1.199 [0.601]	1.029 [0.378]	1.651 [0.536]
woman as head	0.858 [0.307]	1.19 [0.328]	1.525* [0.361]	0.815 [0.396]	1.071 [0.380]	1.146 [0.357]
primary education	1.660** [0.397]	1.967*** [0.350]	3.223*** [0.512]	2.049** [0.606]	2.019*** [0.435]	3.634*** [0.714]
secondary education	2.293*** [0.606]	3.601*** [0.711]	11.47*** [1.996]	3.097*** [0.988]	3.906*** [0.908]	11.70*** [2.465]
daily market				0.873 [0.256]	0.722 [0.155]	0.875 [0.163]
post office				0.72 [0.199]	0.864 [0.174]	0.886 [0.155]
transport				1.429 [0.381]	1.924*** [0.378]	1.447** [0.259]
electricity				1.486 [0.600]	1.473 [0.408]	2.135*** [0.569]
land rights				0.982 [0.307]	0.954 [0.211]	1.426* [0.285]
crop diversification				0.883 [0.174]	1.488*** [0.218]	1.267* [0.160]
	1 np p	2 all p np	3 np np	7 np p	8 farmers p np	9 np np
distance to plot				0.944 [0.102]	0.916 [0.0734]	0.892 [0.0632]
wage*export	1.522** [0.284]	1.203 [0.215]	1.517*** [0.232]	1.682 [0.759]	1.726 [0.683]	2.420** [0.879]
wage*services	1.283** [0.162]	1.293*** [0.129]	1.396*** [0.128]	1.940** [0.598]	1.846** [0.537]	2.384*** [0.652]
wage*import	1.371 [0.328]	1.432* [0.281]	1.713*** [0.315]	2.500* [1.318]	3.086** [1.496]	3.377** [1.609]
wage earners	0.650* [0.160]	0.652** [0.119]	0.480*** [0.0765]	0.655 [0.281]	0.483** [0.177]	0.304*** [0.101]
non farm self- employed	0.751 [0.271]	1.341 [0.294]	2.124*** [0.401]	0.379 [0.397]	1.31 [0.597]	2.814*** [1.056]
multi-activity	1.132	1.083	0.977	1.053	1.046	0.996

	[0.114]	[0.0769]	[0.0622]	[0.131]	[0.0877]	[0.0752]
R-squared	0.219			0.214		
Observations	3894			2338		

Table A7 : Determinants of poverty transitions

Note : Multinomial logit with poverty transitions (2002-2004, or 2004-2006) as the dependent variable.

p np (poor in the first year, non poor in the last year) ; np p (non poor in the first year poor in the last year) ;np np (remaining out of poverty on both years), base category is remaining poor. real per capita expenditures. . The table shows the relative risk ratios.

A * (resp ** and ****) show significance at 90% (95%, 99%) of confidence. Standard errors in brackets.

Columns 2 and 5 are the basis of the summary table in the text.



Figure A1. Vietnam administrative regions